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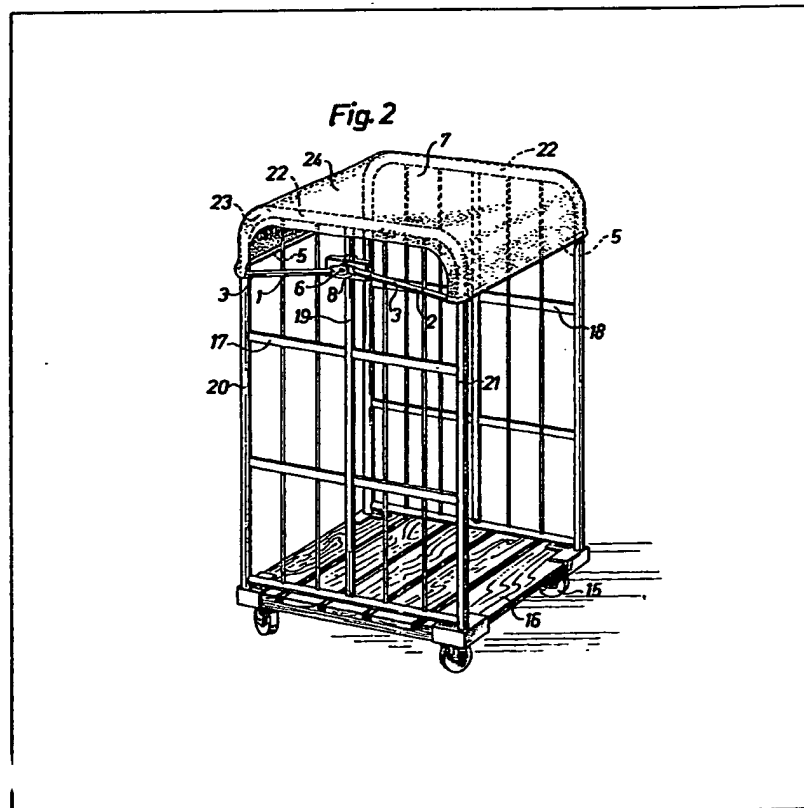
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(54) Improvements in or relating to  
bracing means for pallet side walls

(57) This invention concerns the field of goods transportation and storage particularly by the use of pallets. A pair of pivotally arranged U-shaped bracing members 1, 2 are adapted to be secured to opposite side supports 17, 18 of a pallet firmly to hold the side supports relative to one another. The bracing members may be swung away from a position at which a maximum bracing effect is provided, to allow access to the pallet or to facilitate stacking of two pallets together. A protective top cover 7 which may additionally be provided with side cover portions may be attached to the bracing members if desired.



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Fig. 1

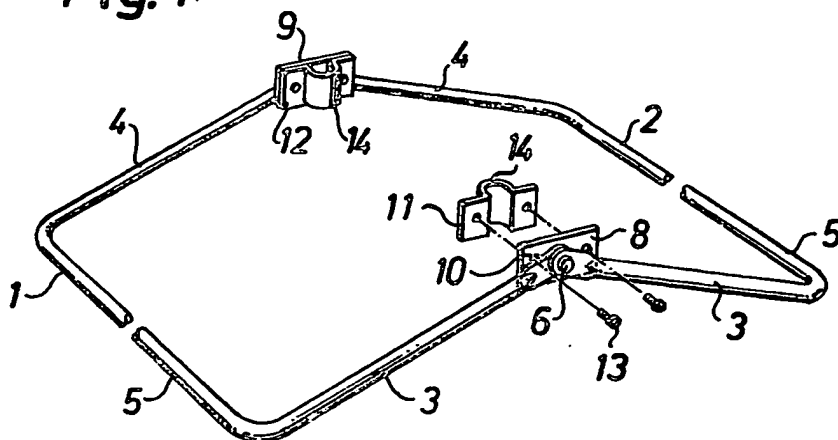
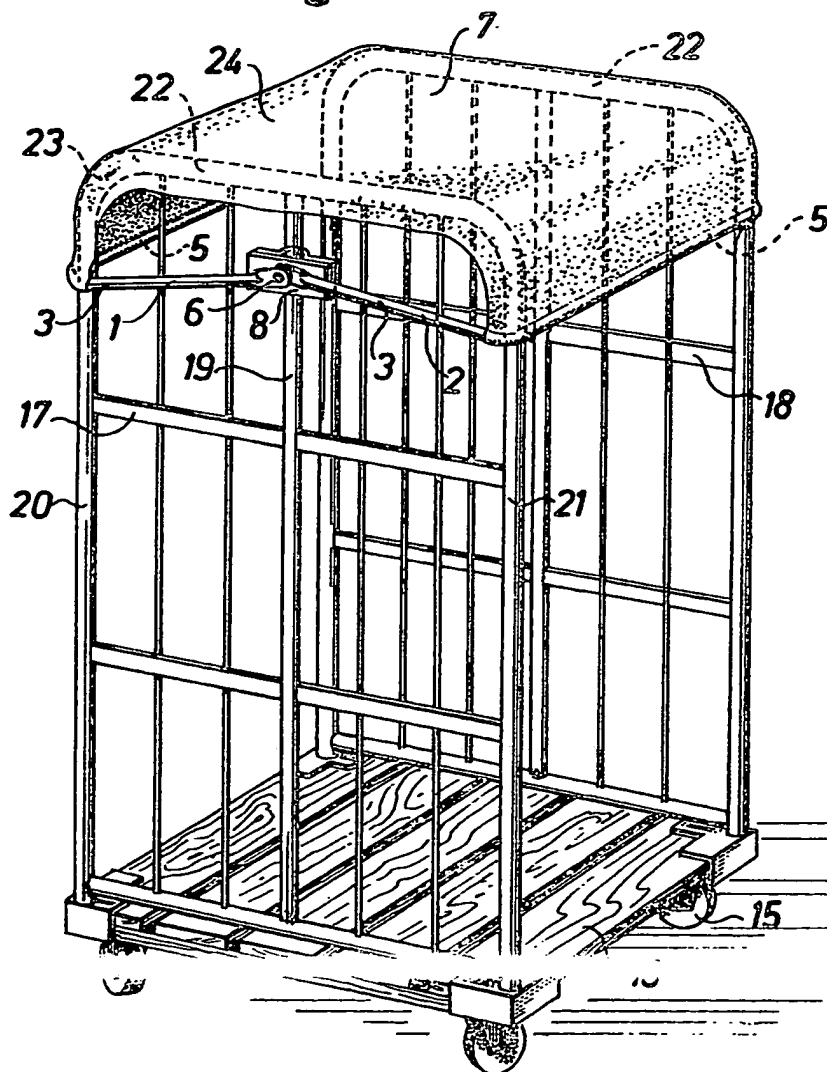


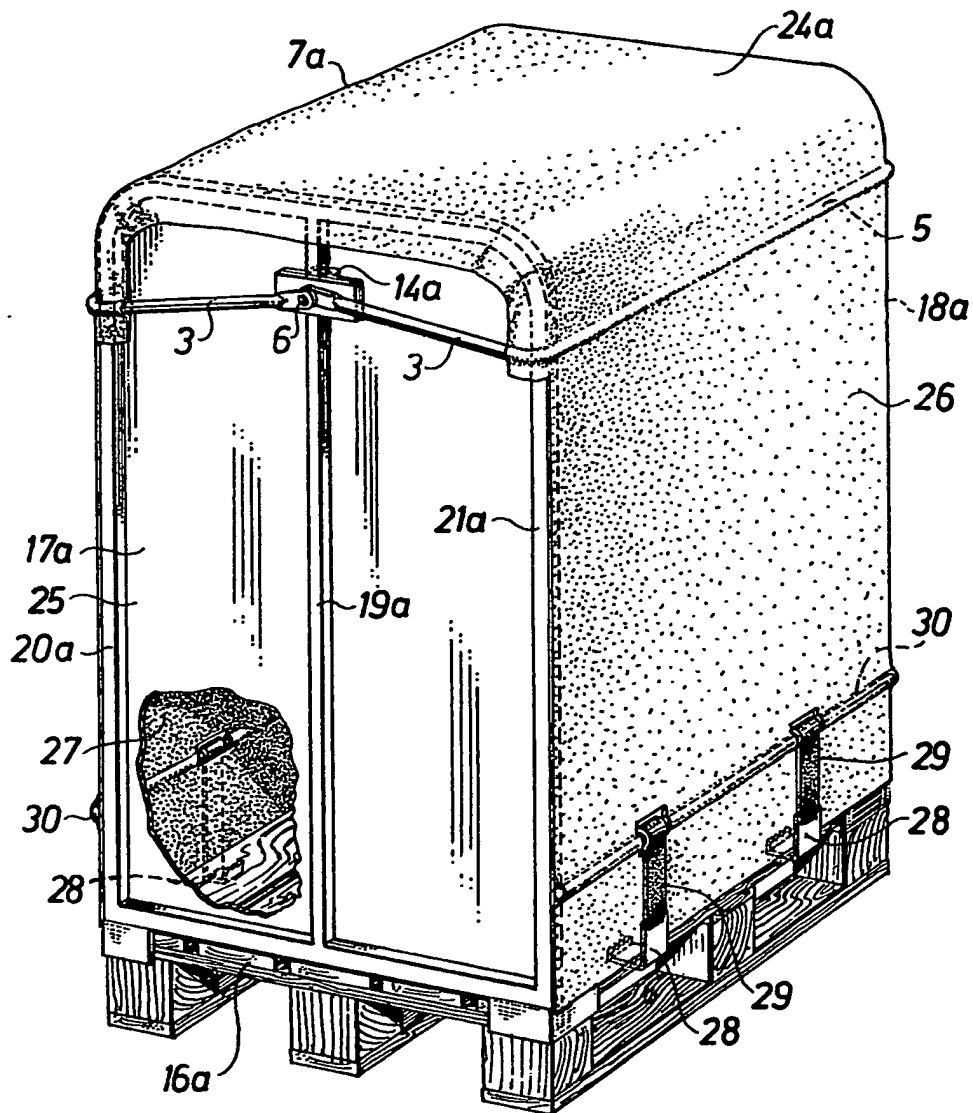
Fig. 2



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Fig. 3



## SPECIFICATION

## Improvements in or relating to bracing means

5 The present invention relates to bracing means and more particularly to bracing means for pallets of the type which have a goods support platform and two upstanding side supports located on opposite sides of the platform.

- 10 When a pallet of the type mentioned above is loaded with goods it is common practice to stretch special rubber straps provided with hooks between the side supports of the pallets in order to secure them to each other for stabilization and to prevent
- 15 the supports from bending outwardly under pressure of the goods supported on the pallet, for example when the pallet is being transported by a fork-lift truck. The use of these rubber straps entails considerable problems. When the pallet is to be unloaded
- 20 the rubber strap must be removed from one of the side supports to give access to the load and this entails some risk since due to the inherent tension of the strap the hook may cause serious injuries to personnel when the strap is being removed. A risk of
- 25 injury also exists when the rubber straps are being stretched into position. In many cases the personnel, especially women, have not had the strength to remove the rubber straps from the side supports and have cut the straps instead.
- 30 This is a particularly dangerous operation due to the high tension release which occurs when the straps are cut and which can result in the hooks being thrown from the pallet with considerable force. This also results in the drawback that the rubber straps cannot be reused but new rubber straps
- 35 must be applied to the side supports when a fresh load is positioned on the pallet. Furthermore, the rubber straps offer no opportunity of combination with separate protective covers for the load, either
- 40 completely to surround the load or give top protection. It might be mentioned that protective covers are often used, for example, if the load is sensitive to light, such as potatoes which must be stored and transported in the dark if they are not to be supplied.
- 45 According to this invention there is provided a bracing means for a pallet having two side supports, said bracing means comprising two bracing members, and each said bracing member comprising two arms and a transverse element extending between
- 50 said arms, said bracing members being mounted on pivotal mounting means whereby each said bracing member may be pivoted relative thereto about an axis substantially parallel with the transverse element of the bracing member; and connecting means
- 55 adapted to co-operate with said pivotal mounting means to facilitate the attachment of said pivotally mounted bracing members to the side supports of a pallet.

In order that the invention may be more readily understood and so that further features thereof may

by way of example and with reference to the accompanying drawings in which:

Figure 1 shows an embodiment of a bracing means according to the invention;

Figure 2 shows a pallet on wheels, a bracing means as shown in Figure 1 being attached thereto and supporting a top cover which is held taut over the side supports of the pallet;

70 Figure 3 shows a pallet for use with a fork-lift truck, provided with bracing means according to the invention, the bracing means carrying a load cover which covers both the top opening and the side openings between the side supports.

- 75 Referring to Figure 1, a bracing means according to the present invention is shown which is intended, as will be seen from Figures 2 and 3, to be mounted on the upper portions of two opposite side supports of a pallet. The bracing means comprises two substantially identical U-shaped members 1, 2, each
- 80 comprising two substantially parallel arms 3, 4 of equal length, and a transverse element 5 connecting the arms. Each member 1, 2 is constructed in one piece from metal tube. The members 1, 2 have a flat
- 85 portion provided with an aperture formed at the free ends of the arms 3, 4 by means of which portions the members 1, 2 are pivotably journaled about two bearing pins 6. Each bearing pin passes through the aperture in one flat portion of each member 1, 2 and
- 90 said pins are secured to or form protuberances from plates 8, 9 arranged between the arms 3, 4 of the members 1, 2. The plates 8, 9 are provided with screw holes 10 for bolts 13, the arrangement being such that assembly plates 11, 12 having correspond-
- 95 ing holes may be bolted to the plates 8, 9. The assembly plates 11, 12 are each formed with a central protruding portion 14 of semi-circular cross-section adapted to embrace a vertical, central circular sectioned bar of one of the side supports of the
- 100 pallets to facilitate attachment of the bracing means to a pallet.

Figure 2 shows a pallet mounted on wheels 15, the pallet comprising a support platform 16 and two side supports 17, 18 arranged opposite each other. Each

105 side support 17, 18 comprises a vertical central bar 19 and two outer, vertical bars 20, 21 which are all joined together by a cross-piece 22 having curved end portions 23. In the embodiment shown, the bars and cross-piece are manufactured in one piece, but if

110 desired they may consist of separate pieces which can be assembled as required.

The pallet is provided with bracing means of the type described above and illustrated in Figure 1, the bracing means being firmly mounted by means of

115 the assembly plates 11, 12 on the vertical central bars 19 of the two opposite side supports 17, 18. The assembly plates are bolted to the plates 8, 9, a suitable distance from the upper cross-pieces 22 so that the horizontal transverse elements 5 do not come

120 into frictional contact with the cross-pieces 22 of the side supports 17, 18 when the members 1, 2 are pivoted about the bearing pins 6. The arms 3, 4 of each member 1, 2 are of such a length that the distance between the journalling point of the arms 3, 4

125 (determined by the bearing pins 6) and the trans-

verse element 5 is slightly more than half the width of one of the side supports, the arrangement being such that the members 1, 2 will clear the curved end portions 23 and the horizontal transverse elements 5

130 will lie in contact with the bars 20, 21 of the side

support at a level lower than that of the bearing pins 6, as can be seen in Figure 2.

The primary function of the bracing means is to fix and position the side supports so that these remain 5 firmly upright, substantially parallel to each other. The pallet is thus more stable and easier to manipulate than is the case with the conventional use of separate rubber straps.

If access is desired to the storage space of the pallet, it is a simple matter to move aside one of the members 1, 2 to a position close to the other member, the arrangement being such that a bracing action is still provided by the members 1, 2 to retain the side supports in their desired positions.

15 The bracing means may also serve as a frame for a protective cover 7 comprising at least a roof section 24 as shown in Figure 2. The roof section 24, consists of some suitable cloth material such as textile-reinforced plastics sheeting which to achieve suitable protection is sufficiently wide to cover the cross-pieces 22 of the side supports. The ends of the roof section 24 are secured to the transverse elements 5 and the edges of the ends extend a short way round from the transverse elements 5 along the 25 arms 3, 4 as shown in Figure 2. Elastic bands or the like may preferably be used at the edges of the roof section 24. For example, two stretch bands can be arranged spaced from and parallel with each other along each side edge of the roof section 24 so that the cross-pieces 22 of the side supports lie between these two bands when both members 1, 2 are folded out to the positions shown in Figure 2. The roof section 24 serves to protect a load supported on the pallet from rain and the like and can very easily be 35 swung away in a desired direction by swinging one of the members 1, 2 upwardly thereby to give access to the goods on the pallet.

The invention also contemplates that, the entire load space can be enclosed so that, for instance, 40 light-sensitive foodstuff such as potatoes will be effectively protected.

As can be seen from Figure 3, a pallet for this purpose comprises a platform 16a provided with foot supports and two opposing side supports 17a, 18a 45 which, as opposed to those in Figure 2, are completely covered or enclosed by masonite panels 25, for instance, or some other suitable material, preferably forming a part of the side supports.

The pallets shown in Figure 3 are also provided 50 with bracing means similar to those in Figures 1 and 2, but differing in that the assembly plates in this case are each provided with a protruding portion 14a having a rectangular rather than semi-circular cross-section and being adapted to embrace a 55 square sectioned central bar 19a of the side support.

In the embodiment shown in Figure 3 the bracing means supports a load protective cover 7a which, as well as a roof-section 24a, also comprises two side flaps 26, 27 arranged to cover and enclose the two 60 opposing openings defined by the two bars 20a, 21a of each of the side supports. The side flaps can each

two hooks 28 attached by short rubber straps 29, or the like, to transverse rods 30 which in turn are secured to the side flaps at a suitable distance from the

bottom edges. The cover 7a is attached to the bracing means in the manner described previously. The cover 7a is made in one piece and its roof section is preferably wide enough to enclose the cross-pieces of the side supports as described previously. After 70 unhooking the hooks 28 from the platform 16a, the desired side can be folded up over the roof section 24a and the load space of the pallet is then accessible once the member 1 or 2, as appropriate, has 75 been swung up together with the load cover as described earlier.

The bracing means may with advantage be provided with suitable locking means to secure the members 1, 2 in the desired position(s). The plates 8, 80 9, for instance, may be provided or formed with knobs or protrusions or the like adapted to co-operate with the bracing means so that one or both of the members can be held in a desired sloping or vertical position to facilitate loading and unloading of the pallet. Alternatively the locking means may be 85 arranged on the arms 3, 4 near the bearing pins 6.

The length of the arms 3, 4 enables each member 1, 2 to be swung from its folded out position to a folded back position near the folded out position of the other member 1, 2. Both members 1, 2 can thus 90 be swung to the same side which is a great advantage as it provides free passage to the pallet from above, i.e. one side opening and the top opening of the pallet are free so that a similar pallet can be 95 received in inverted position in the load space for return transport of two pallets. Considerable saving in transport space is thus achieved when returning pallets provided with bracing means according to the present invention (with or without separate load 100 covers).

#### CLAIMS:

1. A bracing means for a pallet having two side 105 supports, said bracing means comprising two bracing members, and each said bracing member comprising two arms and a transverse element extending between said arms, said bracing members being mounted on pivotal mounting means whereby each 110 said bracing member may be pivoted relative thereto about an axis substantially parallel with the transverse element of the bracing member; and connecting means adapted to co-operate with said pivotal mounting means to facilitate the attachment 115 of said pivotally mounted bracing members to the side supports of a pallet.

2. A bracing means according to claim 1 wherein said bracing members are pivotally mounted by their free ends in such a manner that the two bracing 120 members are pivotal about a common axis.

3. A bracing means according to claim 1 or claim 2 wherein said pivotal mounting means comprises two plates each provided with attachment means for 125 pivotally attaching thereto one arm of each of said bracing members.

4. A bracing means according to claim 3 wherein 130 single protrusion adapted to co-operate with apertures provided in the arms of said bracing members.

5. A bracing means according to claim 3 or claim

4 wherein said connecting means comprises two connecting plates each having a central protruding portion defining a recess and adapted to embrace an upright member of the side supports of a pallet, there being apertures provided in said connecting plates whereby connection of said pivotally mounted bracing members to said side supports may be effected by bolts passing through said apertures and through corresponding apertures in said plates constituting said mounting means, the arrangement being such that an upright member of one of the side supports of a pallet is gripped between one connecting plate and a corresponding plate of said mounting means and an upright member of a facing one of the side supports is gripped between the co-operating plates.

6. A bracing means according to any one of claims 1 to 5 wherein a cover of cloth material or the like is attached to the bracing members, said cover being adapted to form a protective top cover for a pallet.

7. A bracing means according to claim 6 wherein said cover comprises a rectangular sheet of material, two opposite edges of which are respectively attached to the transverse elements of said bracing members and the two other edges of which have elastic bands extending therealong.

8. A bracing means according to claim 7 wherein a further portion of material extends from each of said opposite edges, each further portion being adapted to form a protective side panel for a pallet, means being provided at a lower part of each said further portion to anchor said portion to a pallet.

9. A bracing means according to any one of claims 6 to 8, wherein said cover is formed from textile reinforced plastics sheeting.

10. A bracing means according to any one of the preceding claims wherein means are provided releasably to secure said support members in predetermined positions relative to said pivotal mounting means.

11. A bracing means according to any one of the preceding claims in combination with a pallet, said pallet comprising a goods support platform and two upstanding side supports located on opposite sides of the platform, one arm of each bracing member being pivotally connected via said pivotal mounting means and by means of said connecting means to one of said side supports, the bracing members serving to brace said side supports to retain said side supports firmly in position relative to one another.

12. A bracing means according to claim 11 wherein the transverse element of each bracing member is spaced from the pivoting axis of the bracing member that the bracing member can be swung over the side supports from one side opening of the pallet as defined by said side supports, to the other side opening, thereby to facilitate access to the goods containing part of the pallet.

13. A bracing means substantially as herein described with reference to and as illustrated in Figure 1 of the accompanying drawings.

14. A bracing means substantially as herein described with reference to and as illustrated in Figure 2 of the accompanying drawings.

15. A bracing means substantially as herein described with reference to and as illustrated in Figure 3 of the accompanying drawings.

16. A bracing means in combination with a pallet substantially as herein described with reference to and as illustrated in Figure 2 of the accompanying drawings.

17. A bracing means in combination with a pallet substantially as herein described with reference to and as illustrated in Figure 3 of the accompanying drawings.

18. Any novel feature or combination of novel features described herein.

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